Direct Executive Function Assessment

Approximate length Goal for Main Study	10 minutes, 2 measures used per student (part of 90 minute student assessment and survey)
Mode of administration	Computerized administration using Chromebooks, tablet-like computers with touchscreen capability and an attached keyboard, that will be brought in to the school by the study
Key constructs	**Working memory (N-back tasks)** Working memory is considered a strong measure of reasoning ability, and involves keeping information active in primary memory while acting on it in relation to other information, such as keeping a list of words in memory and then ordering the words alphabetically or by categories. The n-back tasks are measures of working memory often used in research, particularly in neuroscience studies that look at the regions of the brain activated by different types of working memory (that is memory for verbal, symbolic, and spatial information). **Cognitive flexibility (Hearts and Flowers task)** Shifting involves flexibility in thinking and moving between rules, tasks, or mental states. With shifting, each mental set may involve several task rules. Several regions of the brain (cortex and the prefrontal cortex) show increased activation when participants respond to measures of shifting. The Hearts and Flowers task (Dots task) includes a congruent condition, an incongruent condition, and a mixed condition. The task calls on working memory and inhibitory control as students remember the rule and decide whether to inhibit a prepotent response. The mixed condition measures shifting (or cognitive flexibility) as the task shifts between the congruent and incongruent condition. **Inhibitory control (Hearts and Flowers task)** Involves the ability to stop ongoing thoughts or actions, particularly prepotent responses. Development of inhibitory control occurs rapidly in early childhood and advances more slowly during adolescence. The Hearts and Flowers task provides information on inhibitory control (in addition to cognitive flexibility or shifting) in the incongruent condition.